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Signs of Life: Rediscovering Nineteenth Century Indian Key through Glass Analysis

Alexis Broadbent Sykes

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Signs of Life: Rediscovering Nineteenth Century Indian Key through Glass

Analysis

by

Alexis Broadbent Sykes

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Arts
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To my parents for teaching me to be curious and for their endless support of graduate school and higher education, the world needs more people like you.

To my husband for his many difficult hours of reading my writing, dealing with the stacks of books around the house, and his constant confidence in me.

Thank you so much.
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Signs of Life: Rediscovering Nineteenth Century Indian Key through Glass Analysis

Alexis Broadbent Sykes

ABSTRACT

Archaeological investigations of Indian Key Historic State Park in the Florida Keys have uncovered a wide range of historical artifacts from throughout the nineteenth century that reveal how the site was reused and reoccupied through time. This thesis focuses on the glass component recovered from a house cistern complex (Feature F) and a warehouse (Features A and C) during the 1998 to 2002 field seasons. Glass artifacts range from a variety of bottle glass including alcohol bottles and proprietary medicines, to cut glass such as tumblers and decanters, to window glass.

Feature F’s analysis has shown that it maintained a primarily domestic nature despite having been reused by different groups at different times. Glass recovered from Feature F was primarily alcohol bottles, but large numbers of food bottles, medicines, and window glass was also found. The warehouse was used commercially and appears to have been continuously reused. The most abundant item recovered from the warehouse was window glass; however large quantities of alcohol bottle fragments were also recovered.
Also included in the glass analysis is a study of window glass dating techniques using glass thickness. By using a formula originally developed by Randall Moir (1982), and following an example set by Grant L. Day (2001), I was able to illustrate a process for dating nineteenth century window glass that is fairly accurate for determining periods of transition, addition, and reconstruction to buildings occupied over long time periods.

Comparison of the glass from these two features using window glass dating formulas and other comparative evaluations as well as dating and functional analysis is revealing useful information about each of these structures individually, as well as about activity on the island as a whole.
Chapter One

Introduction

This study focuses on the glass artifacts recovered during archaeological investigations of Indian Key Historic State Park, an island located in the Florida Keys. Since 1998, archaeological investigations under the supervision of principal investigator Brent R. Weisman have been conducted in cooperation with the Florida Park Service for the purposes of preservation, conservation, management, and public interpretation. For the study presented in this thesis, two of the excavated features were examined in depth. Feature F is a stone foundation associated with a domestic structure, and the other structure examined was a warehouse, Features A and C. Analysis of the artifact assemblage from each of these structures indicates they both went through a similar series of reuse and reoccupation throughout the nineteenth century. Glass is often given a cursory analysis, but nineteenth-century sites are ideal for glass analysis due to the many technological and cultural changes taking place that are well documented and easy to identify. Glass is also found in abundance and marks a significant amount of utilitarian usages. One goal of this study is to examine whether it can be detected archaeologically how and when each structure was reused, how each structure relates to the history of the island, and to determine if these structures were utilized differently. Analysis of the glass
included categorizing, grouping, and dating. These numbers were then used to compare the two structures statistically for the purposes of dating, identifying occupation and building episodes, and site activities.

Figure 1: Indian Key, view looking North from Lower Matacumbe

Also included in the study is an analysis of the window glass using dating formulas, such as Randall Moir’s formula (1982):

\[ 84.22 \times \text{(Glass Thickness (mm))} + 1712.7 = \text{date of manufacture} \]

for the purposes of dating and the identification of building phases. Flat glass analysis has not been widely used, but this study demonstrates that this type of analysis can be very useful when implemented on nineteenth century sites in order to identify building phases.
Indian Key’s location on the Florida Reef was a major attraction for the community of wreckers that was established in the 1820’s. Inhabitants of the island took full advantage of their proximity to wayward ships wrecked along the reef. This period is dubbed the Housman period after the island’s proprietor, Jacob Housman, who attracted people to the island by creating a familiar town setting with a town square, store, and homes. After a Spanish-Indian attack in 1840 that resulted in the deaths of several of the inhabitants and the burning of the island, the US Navy under the command of Lt. John McLaughlin occupied the island until 1842. During the 1850’s the island was likely utilized during the construction of the Carysfort Reef Lighthouse, and again from 1870 to 1873 as a staging area for the Alligator Reef Lighthouse (Knetsch 2001). During this time
period there was also shipbuilding taking place on the island. It was reported that three schooners and a ship were built between 1868 and 1875 (www.keyshistory.org 2003). Through the 1960’s the island was used for fishing and inhabited by squatters who used the island as a fish camp, and in the 1970’s the island became a Historic State Park. Each of these periods of occupation left a unique imprint on the island and its features that have resulted in the landscape of today. The island is a testament to the struggle of many different people at different times to survive. There is a wealth of archaeological information about each of these occupations that still exists and serves as a unique source of data and history.

Indian Key is covered in dense foliage that has helped to preserve its remains. In many places the foliage is impenetrable, not only keeping out subsequent inhabitants and looters, but also preventing archaeologists from locating all of its features. Prior to excavations by USF, local resident Irving Eyster excavated part of the interior of Feature F in 1965 (Eyster 1965). The first systematic archaeological investigation of Indian Key was conducted by Henry Baker from 1972 to 1973 for the Florida Division of Archives, History and Records Management, now known as Florida Division of Historical Resources (Baker 1973). Now that it is a State Park, the Housman-era grid system for the island has been generally reestablished. Feature F is located on Fourth Street. From historical maps we can show that during the Housman-era Feature F was the home of Mrs. Smith and Mrs. Sturdy. How, when, and why Feature F may
have been reoccupied or reused is unclear from documentation. The Warehouse is located adjacent to the island’s wharves.

For this study, two of the excavated features were chosen for analysis. The first of these is Feature F, a domestic cistern feature; the other is the cistern remains of the Warehouse. Excavation of Feature F took place over two field seasons in 2001 and 2002. The Warehouse was excavated in 1998 and 1999. The glass component recovered from Indian Key includes a variety of types. Prominent identifiable items include alcohol-related bottles such as wine and gin bottles, patent medicine bottles, food-related bottles such as pickle, ketchup, and horseradish bottles, cut glass objects such as decanters and tumblers, and window glass. The basic inventory of recovered artifacts begins to reveal the types of activities associated with the structure, the dates of occupations, what types of people utilized these cisterns for homes, and their necessities for survival, shelter and storage. Identification of bottle types provides an assessment of needs on the island as well as functions of structures and allows for the dating of features and activities at the site. Dating the glass, particularly the bottles, indicates periods of occupation, how needs changed through time, how the standard of living on the island changed through time, and what types of amenities were available at different periods of time.

By comparing two structures on the island, especially two different kinds of structures, I am hoping to present information above and beyond the basics of cataloguing and analysis. Questions to be addressed include: how the site was
reused and reoccupied, how this is reflected in the archaeological record, and what kinds of activities these structures supported.

A flat glass analysis was conducted separately from the other glass analyses. Previous studies by Roenke (1978), Moir (1982), and Ball (1982) have shown that analysis of flat glass thickness can provide a useful tool in dating as well as establishing building events. The main purpose of this analysis is not establishing dates for these structures. Their main dates of construction have already been established through other means. The purpose of this study is to test whether this type of analysis is applicable to Florida’s nineteenth-century sites, and if it can be used to distinguish building phases accurately for each of these structures. Of the formulas tested with Indian Key window glass, Moir’s dating formula proved to be the most reliable. It produced dates that fell within the spectrum of datable window glass, and produced dates that can be attributed to time periods where reconstruction or window replacement would have been most likely. Dates produced from the formula represent the date of manufacture of the window glass, and therefore reflect an approximation of the date of construction. This site was ideal for testing this technique for Florida sites because it meets the basic requirements for window glass dating. Requirements include nineteenth century structures, middle class inhabitants, a preponderance of preserved window glass, and previously established dates of construction that can also be corroborated by established dating techniques from other artifact types.
Figure 3: Location of Feature F and the Warehouse on Indian Key
The sample used for this study was excavated over several field seasons on Indian Key. The Warehouse was excavated in 1998 and 1999, while Feature F was excavated during the summers of 2001 and 2002. The Warehouse was excavated in ten 1 X 1 meter units on the interior of the cistern. The excavation resulted in the recovery of 1,215 glass items. Feature F was excavated on the
exterior of the cistern walls. Excavation resulted in recovery of 2,590 glass items.

All excavated deposits from which the glass sample was recovered were dry-screened through portable 1/4" mesh screens (flotation samples are not addressed in this study). All artifacts collected were bagged according to the standard field specimen (FS) system of one FS per provenience. Profile and plan view drawings were made of all excavation units. Black-and-white and color photography, color slides, and videotape were used to further document the site features. The horizontal grid coordinates arbitrarily begin with 100N/100E, previously established as the northeast corner of Feature G. Grid north in this case is assigned arbitrarily to the long axis of the Feature F building foundation and does not reflect true north (Weisman and Collins 2001).

Glass was identified in the lab by temporal and use-related features as well as type, color, mould seams, size, and shape. The glass has also been categorized into groups based on function such as bottle, pressed/cut, lighting devices, flat glass, and unidentifiable. Specific uses of the glass were categorized into groups such as alcohol, medicine, food, water, personal, window, unidentifiable bottle, and pressed/cut glass.

The following analysis attempts to address the issues discussed above, such as site activities and reuse, through careful examination of the context of the features, analysis of the glass component and comparative analysis.
Chapter Two

Feature F and the Warehouse

Feature F

Feature F is a coral block foundation located on Fourth Street. Comparison to the 1840 Charles Howe map shows that this feature corresponds to the cistern-kitchen building associated with the Smith-Sturdy Cottage (Weisman 2001: 18). This would associate Feature F with a domestic function. In 2001, a total of nine units was excavated along three sides of the feature including six 2 x 2-meter units (designated F1-F6), two 1 x 2-meter units (F7 and F8), and one 1 x 1.6-meter unit (F9) (Collins 2002). In 2002 units were excavated at the corners of Feature F (F10-13). Reports of findings from Feature F’s excavations and laboratory analysis have been addressed by previous reports and theses (Weisman 2001; Weisman and Collins 2001; Collins 2002), therefore only a basic review of findings is included here. A range of artifacts has been recovered from Feature F including ceramics, pipes, glass, nails, metal, buttons, faunal remains, and other miscellaneous items.

Laboratory analysis of the Feature F ceramic assemblage resulted in the identification of types, determination of vessel form and function, cross-mending of sherds, and calculation of Minimum Number of Vessels (MNV) (Collins 2002).
Excavated collections contained 223 MNV with at least 35 sets represented (Collins 2002: 73). The most frequently identified vessels were teawares, comprising 35% of the total MNV and plates consisted of 27% of the MNV. Other identifiable types included bowls, storage vessels, chamber pots, large diameter bowls, platters, ceramic bottles, tureens, mugs, covers/lids, and a saucer from a child’s tea set (Collins 2002: 73). The assemblage is dominated by white ironstone, and more than 51% of the total ceramic assemblage is plain ware vessels.

Pipes are also a prevalent and important piece of the artifact assemblage of Feature F. A total of 166 bowls were recovered, 16 identifiable as the Peter Dorni variety, dating after 1850. Other types recovered include fluted and ribbed pipes, leaf motif, rouletting designs, glazed varieties, Dutch designs, and plain. Plain pipe bowls make up 32% of recovered bowls without design (Collins 2002: 82).

Nails, fasteners, and spikes were the most numerous artifacts encountered in the Feature F excavations (Collins 2002). Nails include cut iron nails (99%) and copper and brass sheathing nails. Iron wide plate cut nails are used in residential general frame construction during the nineteenth century (Keffer n.d.). This substantiates the frame construction of the structures built over the cistern foundations. Sheathing nails are of the type found associated with ship building.

Buttons are another prevalent artifact found associated with Feature F. Ninety-nine buttons were recovered from the excavations, a majority of which are
four-hole buttons. Porcelain buttons are the highest percentage, but there are also metal, bone, mother of pearl, small china, and horn buttons. Included in the metal buttons are seven military buttons, including one identifiable Navy button (Weisman 2001).

Other artifacts of special interest encountered during the excavations of Feature F include a bone toothbrush, ammunition and gunflints, lead shot, and faunal remains. Faunal remains include pig, cattle, and chicken, but are numerically dominated by local fish and turtle as well as Queen Conch shells with top extraction holes (Weisman, 2001).

Feature F has revealed a variety of historical artifacts that span the nineteenth century. Also important to the artifact assemblage are the glass artifacts. The glass component covers a variety of time periods and types. Artifacts from Feature F include fragments from several bottles of Udolpho Wolfe’s Schnapps, Cantrell and Cochrane aerated waters, Cathedral Pickle bottles, black glass wine bottles, an Army Hospital Bottle, and several fragments of elaborate decanters and tumblers. Window glass was also recovered from all excavation side excavation units surrounding Feature F, but not the ends.

The Warehouse

The warehouse is located along Second Street adjacent to where the wharves once stood. The warehouse would have had direct access to the ships docking at Indian Key for the purposes of loading and unloading materials. It is clear from the 1840 map from Charles Howe that the warehouse has stood since
the Housman era, but it is also the most prominent archaeological feature on the island, has good location, and is in close proximity to the shore. Many of these attributes are among the reasons the warehouse was reused by many of the inhabitants of Indian Key throughout the nineteenth century. The warehouse was reused by the military occupants of Indian Key, and would also have been ideal for reuse by others who utilized the island such as those engaged in shipbuilding and lighthouse construction. Documentation has shown that Lieutenant John T. McLaughlin of the U.S. Schooner *Wave* and Commander Isaac Mayo of the *Poinsett* both used Indian Key to their advantage and the warehouse for storage. Mayo stationed a gun barge offshore of the Key in August 1839, leaving thirteen men and a command in order to prevent the enemy from capturing Indian Key with its stores of ammunition, provisions, and arms (Collins, 2002). The officers and barges’ crew lived ashore. Mayo mentions that the crew occupied houses belonging to Jacob Housman and stored provisions in one of the Housman store houses. Due to an outbreak of yellow fever, quarantine and isolation measures were taken, and another of Housman’s warehouses would be modified and used as a hospital for the Navy. The hospital, which was constructed in a ‘commodious sail-loft,’ was designed to be temporary, and when the yellow fever subsided the hospital was discontinued in October of 1839 (National Archives Mayo affidavit January 17, 1846; Buker 1975).

Archaeological evidence supports the idea that Indian Key was reused by the military and others throughout the nineteenth-century. Artifacts range from the early nineteenth century through the early twentieth-century. Since the
warehouse was a prime target for reuse, the archaeological record has been subject to periods of occupation, cleanouts, and disasters that have helped complicate the depositional processes. The glass component is no exception. Window glass dating formulas are helping to sort out the complex archaeological context of the Warehouse, as will be seen in Chapter Four.

Figure 5: Sketch of 1840 Indian Key (www.keyshistory.org)

Excavation of the Warehouse, Features A and C, by USF have predominantly focused on Feature A. Artifacts recovered from Feature A correspond to Feature F in the patterns of reoccupation through time, but analysis of the glass is revealing that while reoccupation patterns have persisted on the island, there is also evidence that structures were utilized differently. Glass artifacts have been comparatively analyzed with Feature F in the hopes of
uncovering an archaeological signature for structural reuse that corresponds with the structures’ size, capacity, capability, location, and intent of use.

There are a variety of classifications of glass from the warehouse, but the range and uniformity of the distribution is not nearly as balanced as Feature F. The assemblage is dominated by window glass. No other categories compete. Many categories are represented by only one or two examples. Warehouse activities were more focused around the purpose of the building: storage. Artifacts associated with medical care, personal care, and lighting are found least frequently. There are a higher percentage of alcohol bottles than other bottle types, but this hardly compares to the number recovered from Feature F. There is a comparatively high frequency in pressed/cut items.

One bottle found, Udolpho Wolfe’s Schnapps, has been found elsewhere on Indian Key. This bottle was advertised as a “medicinal gin tonic and invigorating cordial” and was promoted for women as a “restorative” (Bonasera and Raymer 2001). Production of this product ran from 1848 to 1880. Therefore it is representative of one of the later occupations. Another identifiable bottle is Manners Sarsaparilla Company of Binghamton, New York. This aqua colored bottle dates much later, 1892-1902 or later. Other bottles include small oil or perfume bottles, Florida water bottles, small medicine bottles, pickle bottles, and tumblers. Window glass is the one artifact that is found in greater numbers at the warehouse than Feature F, which is particularly significant given the difference in number of artifacts recovered.

These two foundations are located on the same 11-acre island. Feature F
has had less historical documentation and more intensive archaeological attention, whereas the warehouse has been mentioned many times in historical documents, but has not been as intensively studied archaeologically. The structures also differ in scale and location on the island. In the next chapter I will articulate further the differences between these structures and their shared attributes through the in-depth examination of the glass components.

Figure 6: Collection of Udolpho Wolfe’s Schnapps bottles recovered from Feature F 1848-1880
Chapter Three

Glass Analysis

Introduction

Both Feature F and the warehouse cover a surprising range of glass artifact categories. The glass assemblage from Indian Key has been comprehensive and very informative. Glass can be very easy to identify when there are whole pieces, but it can be very elusive when found in small fragments due to the fact that the composition of glass itself has been relatively unchanged. Other archaeological projects that have tackled the task of identifying glass artifacts have included the Five Points project in New York City, the Bertrand bottles recovered from a sunken steamboat, and a New Orleans research project that focused on patent medicines.

At Five Points, archaeologists have recovered glass from three different areas; an Irish tenement, a bakery, and an Oyster House (http://r2.gsa.gov/fivept/fphome.htm 2003). Recovered from the Irish tenement were sauce bottles, proprietary medicines, colognes, inks, and soda waters. The bakery yielded a multitude of glass artifacts including cups and tumblers, wine glasses, dessert glasses, a salt cellar, gin bottles, scent bottles, proprietary medicines, and condiment bottles. This collection largely centers on food consumption with glass relating to drinking, eating, and flavoring. The oyster house had few glass
artifacts recovered, but those found did relate to food consumption also. The recovered glass included wine bottles, a flacon used for storing olives or capers, and an olive oil bottle.

The steamboat Bertrand went down in 1865 and was known to have sunk in the DeSoto Bend. It was discovered north of Omaha near the present day channel of the Missouri River. It was found below the water table in silt and clay at a mean depth of 28 feet. Over 10,000 cubic feet of cargo were recovered, many of which were fully intact. The contents were divided into six groups for study: foodstuffs/liquor/patent medicines; textiles/wearing apparel/sewing supplies; household goods; mining supplies; hardware/tools/building supplies; and miscellaneous cargo. Glass was recovered from two of these groups: foodstuffs, liquor, and patent medicines; and household goods. A wide variety of products were recovered from the first category including Hostetter’s Celebrated Stomach Bitters and Drake’s Plantation Bitters (Petsche 1974: 50-51). Bourbon whiskey, brandied cherries, chow chow (a table condiment), gin cocktails, essence of ginger, hone, horseradish, jelly preserves, mustard, olive oil, pepper sauce, pickles, baking soda, schnapps (including Udolpho Wolfe’s Schiedam Schnapps) Tamarinds, wine, champagne, and Worcestershire sauce are just some of the types recovered (Petsche 1974: 51-60). From the household goods: glass goblets packed 48 to the case, ink, lamps and flues, mirrors, water tumblers packed 24 to the case, and whiskey glasses packed 144 to the case were recovered (Petsche 1974: 65-67). A separate report focusing specifically on the ceramic and glass bottles recovered from the Bertrand was also
conducted. In this study the bottles were broken down into six classifications (Switzer 1974). Class I included ale, beer, and stout. Class III included wine, whiskey, bitters, and other intoxicants. Class IV was reserved for toiletries. Class V included culinary items. Class VI was for inks and Class VII were reserved for chemicals and medicines.

Elizabeth Davoli’s paper, “Patent Medicines: ethnic or socioeconomic indicators?” was presented at the First Annual South Central Historical Archaeology Conference in 1998. Her research on patent medicines came from archaeological investigations in New Orleans, Louisiana after large quantities of bottles were recovered during excavations; her main research question centered on whether choice of patent medicines could be a result of ethnicity. Sanborn Fire Insurance Maps identified the areas as having been a mix of residential and commercial buildings inhabited by Irish and Italian immigrants of the lower and lower middle class. A closer look at the areas revealed marked differences in class and ethnicity through artifact analysis, Sanborn maps, and the 1900 census reports. For her analysis, Davoli selected three of their research areas to study, squares 101, 72, and 46. Square 101 is identified as having been occupied by Irish immigrants of the lower middle class. Square 72 is identified as having been occupied by Italians of the lower middle class. Square 46 is also identified as having Irish immigrants, but they were of the lower class. Identifiable patent medicines were divided into five classifications: dyspepsia, organ-specific, pain, topical remedies, and tonics. Chi-square tests were performed to determine the correlation between ethnicity and bottles. The chi-square test was performed
with a Yates correction. The end result is the realization of a significant difference between choice of types of medicines used by working poor and the middle class.

Square 46 dated to 1876 or earlier by Sanborn maps which identified the property as having been converted to a vacant field in that year. Thirteen patent medicines were recovered, the majority of which were bitters, typically high in alcohol content and known to have been used by women because it was a covert and acceptable means by which they could consume alcohol. Bitters were also advertised as digestive aids that would have been attractive to poor Irish who would not be able to afford expensive medicines for the inferior food they were forced to eat.

Square 72 contained three features, all privies. Feature one was a brick-lined privy that contained three patent medicine bottles, all organ-specific medications for the kidney and liver. Feature two was also a brick-lined privy, and it contained five embossed patent medicine bottles that represented organ specific, dyspepsia, and tonic. Feature twenty was a brick-walled privy containing 13 patent medicine bottles representing all medicine categories.

Square 101 also contained three features, two of which are halves of the same double privy. In feature two 9 embossed patent medicine bottles were recovered, 7 were dyspepsia bottles high in alcohol content. Feature ten is the south half of a double privy. It contained three embossed patent medicine bottles. Feature eleven is the north half of the double privy, and it contained five
patent medicine bottles; two were dyspepsia, two bottles were the same brand of pain killer, and one was a tonic.

The results were $x^2 = 7.87$, $df = 4$, $p<0.05$, meaning there is a 95% probability that ethnicity did play a role in selection of patent medicine bottles.

Each of these projects has had a different array of glass artifacts, but they have also utilized what resources they had to find answers to how these glass container products were being utilized by consumers for improving their lives in the eighteenth, nineteenth, and twentieth century America.

**Glass of Feature F**

Feature F’s glass distribution covers a range of artifact types that can be associated with domestic activities. Feature F benefits from having a large number of artifacts recovered during excavations ($n = 772$). Unidentifiable artifacts make up 74% of the recovered glass ($n = 573$), but the remaining 26% represent a large number of artifacts, many of which have large diagnostic features. Identifiable attributes have contributed information on dates of manufacture, function, uses, and provides us with indications of the population types who purchase such materials. There are items representing each of the categories of glass and each of the functional classifications. This is different from the warehouse, and is part of what distinguishes Feature F as a structure associated with different activities than the warehouse.

Some of the identifiable items include bottles of many different varieties. Bottles are identified by features such as finish, neck, body, and base. Other
identifying features include method of manufacture such as mould seams, pontil marks, and finish applications. Bottle types include alcohol, medicine, foods, water, and personal. Alcohol bottles include wine bottles, flasks, and gin. Food bottles include jars, pickle bottles, ketchup bottles, and sauce bottles. Personal items are also included, but these items are not exclusive to bottles. Bottles included in this category are generally those for perfumes and colognes.

Figure 7: Bottle hallmarks
By far the most frequent item identified from Feature F is alcohol related bottles, making up 27.6% (n = 55) of the identified items. These items include wine bottles that date to 1820-1850, 1850-1870, 1822-1850 and 1860-1880. Two flasks and a gin dated to 1830-1850.

Bottles are the majority of the glass artifacts recovered from Feature F, but another prominent type is pressed or cut glass. Of identifiable items, pressed and cut glass makes up 15.6% (n = 31). Categories included under this heading are decorative glass and tableware. Decorative glass includes elaborate cut glass that can be attributed to fancy dishes or bowls. Tableware items include decanters and tumblers.

Figure 8: Feature F Glass Distribution Graph
Medicines are also prevalent, making up 14% of identifiable types (n = 28). Medicines are also among the most datable due to the patent medicine era, a period of quick-fix tonics and medicines with flashy advertising campaigns and documented bottle design changes. Medicines include liniment oil, bitters, the US Hospital Department bottle, and other miscellaneous medicine bottles dating throughout the nineteenth century. Food-related bottles are also easily identifiable due to their unique attributes, particularly shape; they make up 12% of identifiable items. Food-related bottles include food jars, ketchup bottles, sauce bottles, american pickle bottles, and cathedral pickle bottles.

Figure 9: Identified Glass Percentages of Feature F

Other items not included in these broader categories are window glass and lighting devices. Window glass is a prominent feature in the archaeological record and contributes a high percentage to the identified glass (17.1% n= 34). Lighting devices also contributed significantly to the identifiable artifacts (9.5%).
The datable artifacts cover the entire spectrum of the nineteenth century. In most cases it is only possible to establish date ranges, not exact dates of manufacture or use. There are glass dates from throughout the nineteenth century, but there are indications of a significant increase in activity in the 1820s that remains constant through the 1850s. The 1850s are also a transition decade, where many of the earlier bottles reach their maximum date range, and later bottles start their minimum date range. This indicates that some bottles date securely within the first half of the nineteenth century and represent a different occupational history than later bottles. The 1860s have twelve bottles that could fall within its time frame; five of these bottles are different pieces of several different Cantrell and Cochrane Aerated Waters bottles. This also marks the highest number of datable glass items that fall within the same date range. Activity increases slightly in the 1860s and 1870s, while the 1880s show a sharp drop that fades into the twentieth century. This is consistent with activities on Indian Key. The majority of significant occupational periods date throughout the nineteenth century, but there is a concentration of activity from 1825 to 1880. Bottle glass has been particularly useful in dating. Bottles have many temporal features including pontil marks, mold seams, finishes, and embossing. Cut glass has an extremely wide temporal range that is not of use in dating. Flat glass dating should not be considered a sensitive enough dating tool to use exclusively, but it can be extremely useful in identifying building phases of nineteenth century sites with known dates, as will be seen in chapter four (Day 2001).
Figure 10:
Cantrell and Cochrane Aerated Waters (1852-1885)
Row 1: donation;
Row 2 & 3: Feature F, Zone 1/ Level 1
Figure 11: Cantrell and Cochrane Aerated Waters
Above: Feature F, F8, Zone 1/Level 1
Below: Feature F, F1, Zone 1/Level 1
The most represented bottle in the sample is Cantrell and Cochrane's Aerated Waters. Cantrell and Cochrane manufactured the bottles between 1852 and 1885, with Feature F’s bottles most likely being manufactured after 1869. Cathedral pickle bottles are also found in relative abundance here and at the
building adjacent to Feature F. They are characterized by their brilliant shades of green, turquoise, and aqua, flat gothic panels, and wide mouthed finishes. Gothic panel designs vary in orientation and amount of arches, vine designs, and crowning. Some of the pieces recovered from Feature F have the tulip capital design that date from the 1850’s through the early 1870’s (McKearin and Wilson 1978). Another type recovered has an inner frame bead-trefoil below a quatrefoil in a large diamond that is advertised as containing tamarinds from a firm in Boston and dates from 1840 to 1843 (McKearin and Wilson 1978).

One embossed fragment from a US Hospital bottle is comfortably dated to a time frame of 1862-1865. These medicinal bottles were produced in a very narrow range of time during the Civil War period, but remained in use in frontier areas into the 1870s. They were manufactured for Army use at factories primarily located in Pittsburg and Baltimore (http://MedicalAntiques.com 2001). The Indian Key example of this bottle is clear in color and has an “A” on one line and “HOSP. DEPT.” on the second line, both lines being straight rather than curved. Due to the bottle’s curation on the frontier it could be attributed to either a Civil War period occupation or the later Camp Bell hospital.

Jamaica ginger bottles were popular during the last half of the nineteenth century and were often used as an alcohol-substitute on “off-limits” military posts (Fike 1987: 16). An extract of ginger was used for flavoring and medicinal infusion. They had a very distinctive oval shape that was almost exclusively used, and could be found in aqua, light blue, and clear. The basal fragment recovered from Feature F is aqua in color.
Figure 13:
US Hospital Bottle (1862-1865)
Feature F: F7, Zone 1/ Level 1
Figure 14:
Jamaica Ginger (Mid to late nineteenth century)
Feature F: F9, Zone 1/ Level 1
Feature F’s artifact distribution represents a structure that has had a consistent function and pattern of reuse through time. The glass component covers a wider range of glass types than is found at the warehouse. Items are also found in greater numbers from Feature F. Glass was recovered from all categories of function and purpose. The spectrum of glass types would be more consistent with a domestic or activity area. A location where everyday activities are taking place including eating, sleeping, socializing, and medical care should reflect a wider range of artifact types indicating the variety of activities taking place within its sphere of influence. Feature F reflects this relationship with glass representing the need for lighting, decorative items, and food related items including bottles for water, pickled items, and sauces. There is also a prevalence of alcohol related bottles and medicinal bottles. Figure 15 illustrates the distribution of glass types of identified items. It clearly shows the prevalence of alcohol related items.

The variety of items recovered from Feature F not only demonstrate the range of activities taking place in association with the cistern feature, but the consistent reuse of the area by several different occupational periods. Several of the alcohol bottles dated to the earlier period, but most dated to later occupations, particularly 1850 and later. The hospital bottle and Jamaica ginger bottle are evidence of later military occupations. The cathedral pickle bottles are representative of mid-century food use, and the Cantrell and Cochrane bottles date to the later part of the century.
Glass of the Warehouse

The glass component of the warehouse is different from that of Feature F. In this case, glass probably varies by both location on the island, and location of excavations in relation to the features. Excavations of Feature F took place
around the outside of the foundations, whereas excavations of the warehouse took place within the walls of the foundation. The processes that lead to the accumulation of material in the archaeological record are different, but have still captured similar material from the same periods of occupation. There are a variety of classifications of glass, but the range and uniformity of the distribution is not nearly as balanced. The assemblage is dominated by window glass. Many categories are represented by only one or two examples. Warehouse activities were more focused around the purpose of the building: storage. Daily living activities that produce artifacts associated with medical care, personal care, and tablewares are found least frequently. There are a higher percentage of alcohol bottles than other bottle types, but this hardly compares to the number recovered from Feature F. There is a comparatively high frequency in decorative cut glass items.

Glass artifacts from the warehouse are typed more frequently (39%) than Feature F (26%), but they lack many of the datable hallmarks that made activity periods at Feature F identifiable. Very few bottles are datable from the warehouse, but it also has a significantly lower recovery of bottles. Window glass becomes the more useful element in dating occupational or activity periods to the structural elements. A significant amount of cut glass was recovered, but it is not a sensitive temporal marker.
One bottle found, Udolpho Wolfe’s Schnapps, has been found elsewhere on Indian Key. Production of this product ran from 1848 to 1880. Therefore it is representative of one of the later occupations. Another identifiable bottle is Manners Sarsaparilla Company of Binghamton, New York. This aqua colored bottle dates much later, 1892-1902 or later (Fike 1987). Other bottles include small oil or perfume bottles, Florida water bottles, small medicine bottles, pickle bottles, and tumblers. Of the identifiable artifacts, alcohol bottles make up 14.6% (n = 18), pressed/cut items 14.6% (n = 18), and food bottles 4.5% (n = 11.4). Other items made up less than 6.5% each. Window glass is by far the biggest
contributor to identifiable artifacts at 43.1% (n = 53). Window glass is the one artifact that is found in greater numbers at the warehouse than Feature F, which is particularly significant given the difference in number of artifacts recovered.

Figure 17
Manners Sarsaparilla Company, Binghamton, NY (1892-1902+)
Warehouse: 99-26, Zone 1/ Level 1
Figure 19 (below) demonstrates the domination of the window glass over all other categories at the warehouse. Only alcohol items, pressed/cut items and food related items are of significant numbers. Medicine, personal, and lighting are found in numbers of eight or less.
The warehouse glass is less evenly distributed than Feature F. The warehouse’s primary function was for storage, but it was not used exclusively for this purpose throughout the nineteenth century. Already mentioned were documents that listed the warehouse being used not only for storage, but also for housing a hospital in late 1839. The foundations were likely reused for a variety
of purposes by different occupations. The glass analysis reveals that although function for the foundations may have changed at times to suit the needs of the islands inhabitants, the archaeological record continues to signify the primary function of such a large feature: storage. Glass percentages indicate that this area was not used as regularly as Feature F for activities that more often occur at home, such as the items represented by the categories of medicines, tablewares and bottled waters.

Discussion

Feature F and the warehouse were both cistern features that supported activity on the island throughout the nineteenth century. However, the archaeologically recovered glass component represents each structure differently. Feature F’s domestic attributes are represented by the even distribution of glass across the spectrum of categories. This indicates the continual use of the area for habitation and social activities. Glass from the warehouse deviates from this pattern slightly, especially in its preponderance of window glass. However, the glass distribution from the warehouse also reflects lower numbers of domestically related items, signifying the warehouses primary commercial use.

Both structures were represented by a spectrum of glass, but each had one group that dominated the rest. For Feature F this was by alcohol. For the warehouse it was window glass. Interestingly, for both structures the second most significant glass category was the other’s most dominant. Both structures
share similar items in their top six categories, though in different orders. Feature F’s top categories of alcohol and window glass are followed by pressed/cut, medicine, food, and lighting. The warehouse’s top items of window glass, alcohol, and pressed/cut glass are followed by food, personal, medicine, and lighting. While both structures may share similar rankings of glass relative to other glass recovered from the same structure, they differ greatly in relative percentages. Feature F’s top two categories represent only 44.7% of identifiable glass, due to the consistent distribution of glass across categories. The warehouse has over half (57.7%) of its glass component represented in its top two categories.

The raw numbers and percentages both address the differences the glass component demonstrates between the occupational histories and primary functions of these structures. The differences between Feature F and the Warehouse are subtle, but the overall distinctions represented by the analysis of the glass clearly distinguish that marked differences do exist between the structures. Feature F’s pattern is clearly more comprehensive and representative of a site that has seen continual reuse for functions similar to the original occupation of Feature F during the Housman era wrecking community. The warehouse’s pattern is less comprehensive and it is dominated by two artifact groups. The warehouse is more representative of its original storage function, and continual reuse for a multitude of purposes such as a hospital. It also seems clear that this area was not reused as intensively as Feature F.
While Feature F and the warehouse may have experienced differences in occupational reuse, they shared a similar series of reoccupations that have been represented by the glass component. Glass signatures have been left behind by military occupations as represented by the Jamaica ginger bottle and the US Hospital Department bottle. Both represent mid to late nineteenth century occupations through the presence of pickle bottles and patent medicines. Earlier occupations are represented by only a few specimens with temporal markers such as early pontil marks or other pre-machination hallmarks.
Any of these categories of glass could potentially be found with any group inhabiting the island; however, some categories are more likely to appear with one group or another. For instance, cut glass is not likely to have accompanied a roaming group of squatters to the island. It is more likely that it came with a “proper” family moving to the idyllic Housman Indian Key retreat or with the well-to-do Lt. McLaughlin who has purchase records of requesting cut-glass decanters and tumblers for his military outfit (Weindenbach1995).

Food-related items can be attributed to any group inhabiting the island. Food is a universal necessity for life; however, pickle and sauce bottles recovered from Feature F date to the mid to late nineteenth century, indicating this category does not represent the Housman-era occupants. Likewise, most patent medicines date to this later timeframe. Alcohol-related items date throughout the nineteenth century, and in this case more are found earlier in the century than later.

Based on these generalizations, it appears that the earlier inhabitants of Indian Key during Housman’s reign tended to be family groups, including women and children, though the island’s populations remained predominantly men (Viele 1996: 58). This earlier group appears to be represented by alcohol, cut-glass, and window glass. This period represented a need for more substantial and reliable habitation structures. After the massacre, the military’s occupation represents a transition period on the island between stability and long-term family groups to family units as well as individuals seeking survival in a much less substantial setting. Later groups are represented by alcohol, patent medicines
(likely used to self-treat illnesses on the frontier and for their extreme alcohol and drug contents), pickled foods, and alcohol.

The glass analysis strengthens the archaeological evidence for post-Housman occupations. Most identifiable glass is representative of the mid to late nineteenth century, while the cistern features themselves stand as testaments to the earlier occupants. The glass analysis of Indian Key further substantiates the persistence of reuse and reoccupation of Indian Key and its continued importance as a safe haven with deep channels on a dangerous reef.
Chapter Four

Flat Glass Analysis

Background

Flat glass analysis is a relatively new and under-utilized technique for understanding site activity on nineteenth century sites. Window glass is a common artifact type found on historic sites, but is often given only cursory analysis. For the last 25 years different techniques of analyzing flat glass thickness to determine dates of manufacture has been explored. A series of studies by Chance and Chance (1976), Roenke (1978), and Moir (1982) established the groundwork for flat glass analysis. Recently, new studies into window glass thickness dating (Day 2001) have attempted to expand the capabilities of the technique and its applicability to be used on most nineteenth century sites. My study hopes to prove that window glass can not only be quickly analyzed, but can be a very useful and important addition to standard analysis. I also hope to demonstrate that window glass dating should not be confined to pristine, short-duration habitation sites. The following analysis tests the capabilities of the techniques and formulas developed by Roenke (1978), Moir (1982), Ball (1983), and Day (2001) for application to the Indian Key window glass. Indian Key is an ideal test subject for nineteenth century Florida window
glass dating because it meets many of the basic requirements. Requirements for a site include nineteenth century structures, middle class inhabitants (upper class society was more likely to have used special, expensive types of glass to adorn their windows which are not applicable to this technique), a preponderance of preserved window glass, and previously established dates of construction that can be corroborated by established dating techniques from other artifact types.

Window glass dating first involves establishing a good sample. The sample should include only flat glass that can clearly be determined to be window glass by its uniformity in thickness. Uniformity is determined by taking three distinct measurements across the glass, as well as having glass of sufficient size so that it cannot be confused with flat glass from other sources such as flat panel bottles. The dating process included selecting the flat glass determined to be window glass, taking three distinct measurements and finding their average.

Chance and Chance (1976) first hypothesized that window thicknesses increased through time during the nineteenth century. They proposed an absolute chronology based on the age ranges for primary thickness modes from their Kanaka Village/Vancouver Barracks sample. Roenke (1978) then tested their findings with his analysis of thirteen sites in Washington and Idaho. Roenke’s research supported thicknesses corresponding to date ranges. Randall Moir (1982) tested this process on 45 historic sites and structures, primarily from Texas, by selecting the mean thickness and relating it to the
specific date of construction. Moir then applied the information to a least squares linear regression and produced the equation:

\[ ID = 84.22 \times (TH) + 1712.7 \]

where ID is the initial date of construction/occupation and TH is the mean thickness value (in mm). At about the same time Donald Ball (1983) was also producing a formula for window glass dating. Ball developed the formula:

\[
\text{Date} = \frac{M - 1.00}{0.0286} + 1800.
\]

The interest in window glass dating and the development of new formulas was growing, but these techniques still applied only to sites with short occupational periods. There were also arguments that window glass dating was too sensitive to such things as window replacements and long occupational histories because of the mixing of glass from different eras in the depositional layers. These dating techniques all relied on a uniform sample of glass to produce a single date. Window replacements would skew the single-date results because there were actually glass fragments from two different time periods.

Earlier, Chance and Chance (1976) suggested that modal frequencies could be used to indicate structural additions. Grant L. Day (2001) presented research that expanded on this concept at the South Central Historical Archaeology Conference. Day used Moir’s (1982) regression formula to date individual glass fragments and then plotted them into a histogram to detect frequencies that could indicate building additions. This method produced results that correspond with the artifact dates and archival research already established for this site.
The situation is ideal on Indian Key for testing these different techniques for window glass dating. The following analysis will test these different formulas and techniques to determine their applicability to dating nineteenth century Florida sites by comparing the results of these tests to the documentary evidence for occupational periods on Indian Key, and to the dates of occupation determined by analysis of artifacts.

Testing

The first step was to choose a sample of window glass from the Warehouse and Feature F that could clearly be determined to be window glass by its flatness and size. Three thickness measurements were taken and logged into a Microsoft Excel spreadsheet and the average of the three measurements was calculated. The measurement used for the analyses was the average. Attributes under consideration are the applicability of date ranges versus specific dates, the fitness of formulas for determining dates, and the process of using modes to ascertain building phases.

I started with checking thickness measurements against the date ranges proposed by Roenke. Using the theory set out by Chance and Chance (1976) that modal distributions could indicate building episodes, I applied the date ranges to individual glass fragments and looked for frequencies of dates. Two problems were identified with using Roenke’s date ranges for Indian Key glass. The dates tend to be a little early for occupation on Indian Key, and the earlier date ranges, 1810-1845, are not well distinguished from one another, so that it is
impossible to distinguish any phases from the most active period on the island. Roenke’s date ranges are close approximations of the probable dates for Indian Key, but it is not a sensitive enough tool to distinguish modes or for separating different occupations from others simply based upon date ranges. Roenke also notes his data, “indicate some minor variations in the chronological scheme when it is applied to other sites in the Pacific Northwest” (Roenke 1978: 116). It is not, therefore, unusual that these dates should vary drastically from the Pacific Northwest to the Florida Keys, even though the occupations are contemporaneous.

Moir’s formula was intended for determining a single date based on the mean window thickness of a sample of window glass. By applying his formula to each window glass fragment and determining a date of manufacture each fragment can be plotted into a histogram to determine frequencies and identify building phases. The resulting dates initially seem to have transitioned well into being used independently for establishing modal frequencies. I applied the window glass averages to Moir’s (1982) formula by inputting the formula into Excel. The resulting dates were then put into the statistics program SPSS. The histogram produced many encouraging results, including sharp increases in frequencies that may indicate periods of building transitions.

Finally, I took the same averages as used in the previous trials and applied Ball’s (1984) formula in Excel. At first glance (see fig. 20) many of the dates appeared to be much earlier than the initial dates established by Moir’s
formula, and after plotting them in SPSS it was clear that these dates were far too early to be accurate results for Indian Key window glass.

Based on these trials I determined Moir’s formula to be the most applicable to Indian Key’s sample because it not only returned results that may correspond to possible dates of transition on Indian Key, but because the majority of calculated window glass dates fall within the nineteenth century. The relationship between window glass thickness and time is stronger during this period than any other because of the technological and manufacturing changes that were reshaping the window glass industry during this time period (Schoen 1990: 62). After 1920 window glass was standardized and thicknesses were more a function of type than time. Prior to 1800 window glass technology was still developing, pane thicknesses were variable, and formulas have not been able to establish any control or standardization for dating in this time period. For this reason I have decided the Ball formula is unreliable for dating Indian Key. The dates established by Ball’s formula are not only very early for occupation on Indian Key, but they are too early to indicate datable glass on Indian Key. Moir’s formula, therefore, is the most accurate and reliable for determining window glass dates on Indian Key.
Figure 21: Ball Formula Comparisons
Feature F

Ninety-one pieces of glass were analyzed from Feature F. Dates ranged from 1780 through 1927. Both ranges are at the limits of flat glass dating, but reasonable. The highest frequency of glass is dated at 1830.

Since calculated dates represent the date of manufacture of the window glass, and therefore reflect an approximation of the date of construction, there is some lag between the date calculated by the formula and the expected dates of occupations on the island. Feature F shows distinct jumps in window glass dates. This is representative of distinct building (or rebuilding) periods followed by periods of habitation. The first building period represented may have taken place prior to, or near 1820. In 1821 Florida became a U.S. territory. Prior to this, documentation on Indian Key is primarily on Spanish maps. In 1824 Silas Fletcher settled on Indian Key to sell goods to mariners. He is the first documented settler on the key, but the business opportunity there indicates that the general area was being utilized at this time (www.keyshistory.org 2003). Fletcher was soon followed by many other settlers and by 1826 a competing store opened on the island (www.keyshistory.org 2003). Window glass dates indicate the first major jump in activity took place in the 1830’s, the height of activity for the wrecking period of Feature F. In 1831 Jacob Housman solidified his presence on the island with his purchase of a two-story house, a store, a 9-pin bowling alley, billiard room, guesthouse, and kitchen (www.keyshistory.org 2003). It is not surprising that this time period should be so well accounted for by the window glass dates. There are thirteen dates for 1830, the highest frequency
of window glass. No window glass dates are reported again until 1837, which is represented by twelve dates. Considering the island was attacked and burned in 1840, and subsequently rebuilt immediately by the Navy for their own use, this date is not improbable either.

Figure 22: Feature F Flat Glass Dates Distribution

![Feature F Flat Glass Dates Distribution](image)

Another construction period may have taken place in the mid-1840’s. In 1844 the “Cuban Hurricane” reportedly wiped out the Navy’s buildings on Indian Key (http://www.keyshistory.org/hurricanelist.html 2003), which may have resulted in the need for widow replacement during this period of occupation. Another building phase may have taken place in the 1870’s, another known time of activity on the island, including construction of Alligator Reef Lighthouse and the establishing of the Camp Bell hospital detachment on Indian Key in response to a virulent yellow fever outbreak in Key West (www.keyshistory.org 2003).
The dating formula has produced some interesting results for Feature F. These dates represent distinctively separate modes of dates. This corroborates the theory that distinct modal frequencies can represent building transitions and phases. The dates produced with the formula are representative of active time periods and transitions on the island.

**The Warehouse**

Window glass is the one type of glass that is found in greater numbers at the warehouse than Feature F, which is particularly significant given the difference in number of artifacts recovered. Window glass shows continuous use of the warehouse throughout the nineteenth century. This is also different from Feature F, which displayed breaks in periods of use followed by sharp increases in frequencies. This is not to say that the warehouse does not exhibit discernable jumps in frequencies. While almost every few years are represented by at least one fragment of glass, there are several large spikes that clearly signify a difference.

The warehouse sample includes 141 fragments with dates ranging from 1807 to 1932. There are four substantial modal frequencies, and two modes of interest. The first significant jump in frequency is found in 1831. Both Feature F and the Warehouse have a jump in frequency at this time period, which is also the beginning of an active time on the island. The most important spike in frequency is in 1839, indicating a definitive window replacement period. Given that this date is representative of the estimated date of manufacture for the glass,
it would coincide with the reconstruction of the warehouse after it was burnt down during the 1840 massacre of the island. The year 1847 has a slightly smaller, but still important rise in frequency. Another major jump in activity surrounds 1856. Again, this was a period of activity in the area due to the Third Seminole War that lasted from 1855 to 1858. A military garrison was sent to Indian Key in 1856 (www.keyshistory.org 2003). Two less substantial frequencies appear at 1873 and 1881. The island was inhabited during this time period by people involved with lighthouse construction, shipbuilding, and the Camp Bell Hospital.

Figure 23: Warehouse Flat Glass Date Distribution

Like Feature F, the warehouse has some window glass fragments that date prior to any documented period of inhabitation on the island. This should not be assumed to mean that the formula is inaccurate. Window glass is
primarily produced by the crown or cylinder glass method. On the small fragments of glass recovered from most sites it is nearly impossible to tell from what part of the pane the fragment has come from. Earlier sheets were likely to be thinner towards the edges than in the center (Moir 1982:13). Some variation in thickness is to be expected across a pane of glass, particularly the earlier samples. Given their low frequency it is more likely that these fragments represent unusually thin glass or glass from a thinner part of the pane than actually representing the presence of buildings with windows prior to the first known occupations. Again, the dates derived from Moir’s formula seem to correlate well with known activity periods on the island that would have resulted in building transitions.

Summary

Moir’s dating formula proved to be an interesting examination of site activity on Indian Key. The formula derived by Ball (1984) aimed at creating a similar technique, but did not prove to be an accurate measure for this site. Roenke’s date ranges are useful for determining age of construction and for identifying general time periods. It is not, however, sensitive enough for targeting specific dates or to determine building phases over time. By using Moir’s formula, utilizing the theory proposed by Chance and Chance (1976), and following the example tested by Day (2001), we were able to illustrate a process for dating window glass and synthesizing valuable information. More important, it was demonstrated that this technique can be used with a fair degree of accuracy.
for determining periods of transition, addition, and reconstruction on nineteenth century sites on the frontier of Florida.

Window glass analysis should not be relegated to merely indicating architectural features. Window glass can and should be treated as an important piece of the historic artifact assemblage. This study and the analyses cited here in have demonstrated that window glass dating can be accurate and useful. The actual process of determining the thicknesses and calculating the formulas is quick and easy. Each of the features sampled in this study was measured and calculated in one afternoon. By plotting dates derived from individual glass fragments into a histogram, modes can visually be inspected and used to ascertain periods of building transitions. These transitions may be indicative of important activities that took place within the confines of the structures they surrounded. Feature F and the Warehouse demonstrate that this formula and this technique are applicable to nineteenth century Florida sites inhabited by the middle to lower class.
Chapter Five

Summary and Conclusions

Summary

Feature F and the warehouse are two features on an island where human life has altered the landscape. People have come to this little island seeking fortunes, adventure, escape, solitude, and new beginnings. Each group added their possessions and evidence of their necessities and desires to the depositional layers of the island, including a variety of glass objects. These artifacts represent the needs, the times, and the people. Through the archaeological recovery of these artifacts from their associated features, the glass component analysis has lead to valuable insights into the existence and ordeals of the people who survived on the key.

For the study included in this paper, two of the excavated features on Indian Key were examined in depth. Feature F, a stone foundation associated with a domestic structure, and a warehouse, Features A and C. Analysis of the artifact assemblage from each of these structures indicates they both went through similar series of reuse and reoccupation throughout the nineteenth century. One goal of this study was to examine whether it can be detected archaeologically how and when each structure was reused, how it relates to the history of the island, and whether it can be detected if one structure was utilized
differently from the other. Through glass analysis I was able to ascertain that these structures both underwent many periods of reoccupation as was indicated by historical documents, and identify which structures were likely used during these occupations. Feature F was not reused as continuously as the warehouse, but it did maintain a primarily domestic function. With window glass dates I was able to fine-tune more generalized dates provided by bottle glass. Other glass types may not have been as useful in identifying time periods of use, but they did provide insight into the types of activities taking place, and the standard of living for these structures. The warehouse appears to have been reused continuously by each group of inhabitants on the island, contributing to its garbled depositional layers and artifacts. By identifying periods of use for each structure, I was able to relate the sequence of reuse to the documented groups inhabiting the island and how the history of the island was reflected in the archaeological remains.

Feature F and the warehouse were both cistern features that supported activity on the island throughout the nineteenth century. However, the archaeologically recovered glass component represents each structure differently. Feature F’s size and domestic attributes are corroborated by the even distribution of glass across the spectrum of categories, indicating the continual use of the area for habitation and social activities. Glass from the warehouse deviates from this pattern slightly, especially in it’s preponderance of window glass. However, the glass distribution from the warehouse also reflects lower numbers of items that would be associated with a structure where domestic
activities were taking place, representing the warehouses primary commercial use.

The glass component of each of the features was composed of similar groups, but each feature was characterized by its own signature of artifacts. Feature F’s glass component was equally distributed across the spectrum of glass, while the warehouse was dominated by three artifact groups. Activities associated with Feature F are represented by both distribution and type. Although there is a dominance of alcohol bottles, there is good representation of food bottles, medicines, pressed/cut items, and window glass. These items also cover a spectrum of time periods. Activities associated with Feature F tend toward daily activities. On the other hand, the activities associated with the warehouse are clearly more commercially based. Daily-need items are not found in abundance, and the glass does not cover such a wide range of groups.

Just as each feature is characterized by the activities that took place in its context, the glass from each feature also indicates the distribution of activities temporally. The glass indicates that while the structures may have been utilized differently, they were often reused contemporaneously. Bottles were helpful in establishing dates, but window glass also proved useful in identifying phases of occupation. Bottles from Feature F date from the early nineteenth century through the 20th century. Most bottles are representative of the mid to late nineteenth century including the Cantrell and Cochrane aerated waters, pickle bottles, US Hospital Department bottle, and the Jamaica ginger bottle. The warehouse has fewer datable bottles. Those that were datable had date ranges
of 1848-1880 and 1892-1902, also indicative of the mid to late nineteenth century. While there is some variation in dates, the majority represent activity during the same occupational periods.

Figure 24: Glass types

Also included in the glass analysis was a flat glass study. Flat glass analysis has not been widely used, but this study demonstrated that this type of analysis can be very useful when implemented on nineteenth century sites in order to identify building phases. Window glass dating was an interesting test case applied to Indian Key. Of the formulas tested with Indian Key window glass,
Moir’s dating formula proved to be the most reliable. It produced dates that fell within the spectrum of datable window glass, and produced dates that can be attributed to time periods where reconstruction or widow replacement would have been most likely. Window glass dating formulas as an independent means of dating is still not recommended, but I believe this study reinforces its applicability for observing building transitions.

**Conclusions**

The goal of this research has been to utilize the glass component of two difficult proveniences to recover as much information as possible about life on Indian Key. Glass analysis has the potential to identify a range of activities including: the level of society on the island through the types of cut glass found, their medical needs through the types of patent medicines favored, types of foods eaten through the sauces and jars recovered, types of drinks, and the harshness of the environment by the consistent need for window replacements. To some degree each of these possibilities were explored and expanded to encompass the realm of identifying activities across space and time. Feature F contains a range of remains that illustrate the needs and desires of people struggling to survive on the frontier. The glass component of Feature F covers a spectrum of categories that represent an excellent focus for understanding the array of activities associated with living on the island. The warehouse is not as rich in glass artifacts, but it is equally interesting. The warehouse demonstrates the diversity of needs and experiences that can be encountered. The warehouse
also signifies the differences that can be seen archaeologically when a structure is reused, but not continuously for the same purpose.

Over time the standard of living changed on the island, and the types of people visiting altered over the years. During the Housman era a certain level was attained in their standard of living and groups of men were joined by women and children in family units. This period was not to last in such a rough environment and the military quickly took control of the island. Sophistication did not completely leave the island until later, but with Lt. McLaughlin certain standards of taste were maintained. In the later years of the island, the location on the frontier became more apparent with the introduction of higher quantities of pickled bottles and patent medicines appearing in the archaeological record and the disappearance of cut glass, window glass, and other less important items. During the second half of the nineteenth century the island was primarily utilized by construction workers and for fishing. Later Indian Key would become a favorite picnic spot for locals and today it is visited regularly by tourists.

The glass analysis of Indian Key further substantiates the persistence of reuse and reoccupation of Indian Key. It reinforces the evidence for continuous use of the island long after its heyday of the Housman era. Greed and Indian attacks did not deter hopeful locals from constructing an existence on the key. We can see the clues they left behind in the medicines they needed, the food they ate, and the luxuries they could afford. Life could not have been easy for anyone on Indian Key, far from regular doctors and living in the path of
unpredictable weather, but the archaeological evidence says they survived all these obstacles and found a way not only to exist, but to thrive.
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